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A NEW PYCNODONT FISH FROM THE CRETACEOUS OF ARKANSAS

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Remains of pycnodont fishes are very rare in American formations, and most of the known species have been described from single dental elements or from fragments of the dentition. The find of two mandibulars belonging to a new species, each with nearly the complete mandibular dentition, is therefore of special interest. The two specimens were collected a few years ago by Mr. Charles M. Barber, of Hot Springs, Arkansas, who sent them to me for identification and study. They represent a new species of the genus *Anomoeodus*.

In 1941, I published a preliminary note on these specimens. Later, the fossil vertebrates that had been collected by Mr. Barber in Arkansas, over a number of years, were acquired by Chicago Natural History Museum, and the two pycnodont specimens are now in the paleontological collection of that museum. My thanks are due to Mr. Bryan Patterson, Curator of Paleontology in Chicago Museum, for various courtesies in connection with the publication of this paper.

The formation from which the pycnodonts were collected is a marl of Cretaceous age, exposed in gullies on farmland. In the same formation occur numerous shark teeth of various species, single bones and teeth of fishes, plesiosaurs, crocodilians, and fragments of the shells of marine turtles. Two new species of marine turtles were recently described from this collection by Karl P. Schmidt (1944). They are based on two large, nearly complete shells in Chicago Museum, reconstructed from numerous pieces and small fragments pertaining to these two specimens.

Among numerous fragments and teeth of fishes sent me for examination by Mr. Barber, there were a few large, awl-like, palatine teeth, about two inches long, characteristic of the genus *Enchodus*, and similar to such teeth in some species of *Enchodus* from the Nio-

brara chalk of Kansas. Hence these large, predaceous fishes were represented in the Arkansas Cretaceous sea.

This varied marine vertebrate fauna, including large, predaceous forms, indicates an open sea. I have also found among the fragments two teeth of Balistidae (trigger fishes), which are warm-water fishes. Hence it is very probable that the habitat of our pycnodont was a warm sea.

Anomoeodus barberi sp. nov.

Holotype.—Chicago Natural History Museum No. P27078. A right mandibular with nearly the entire dentition. Collected by Charles M. Barber.

Paratype.—Chicago Natural History Museum No. P27079. A right mandibular with the dentition less complete than in the type, lacking the outer part of the small pavement teeth. Collected by Charles M. Barber and Henry Moreland.

The two specimens were collected at different times, at places a few hundred feet apart but at approximately the same level in the formation.

Horizon and locality.—Marlbrook Marl, Gulf Series (Upper Cretaceous). About one mile northeast of the junction of the Okolona-Hollywood Road to Arkadelphia, Arkansas, in a gullied field on the Gather Brothers farm.

Description.—Mandibular about 5 cm. in length, measured on a line parallel to the symphysis. Principal row, if complete, with about nine or ten teeth, which gradually increase in size backward to about the middle of the row; then three teeth of approximately similar size. The large teeth taper gradually to a rounded point at the inner end and are rounded on the outer end. Last place in the principal row occupied by a single, elliptical tooth (as in the paratype), or by two smaller teeth placed end to end (as in the type). Length of a large tooth in the middle of the row, 13 mm.; its maximum width contained about three times in its length.

Symphyseal teeth: A row of about seven small teeth, varying from round to elliptical in outline, placed close to the principal teeth, and a few additional small teeth along the posterior part of this row. (Only the single row in the paratype.)

Outer teeth: Two rows of small teeth adjacent to the principal teeth and, on the outer side of these, a pavement of small teeth, decreasing in size progressively outward. Width across the two



FIG. 9. *Anomoedus barberi* sp. nov. \times about 2. *a*, holotype; C.N.H.M. No. P27078. *b*, paratype; C.N.H.M. No. P27079.

rows equal to about two-thirds the width of the largest principal teeth. Most of the small teeth in the outer pavement and in the symphyseal row with a small indentation near the middle of the upper surface.

The species is named for Mr. Charles M. Barber, who collected these and many other specimens of fossil vertebrates of Arkansas.

Discussion.—The type (fig. 9, *a*) is one of the most complete mandibular dentitions of the genus *Anomoeodus* ever found. It indicates clearly that a pavement of small teeth, progressively decreasing in size outward, covered the region near the angles of the lower jaw. In the great majority of specimens this outer, finer pavement is missing, having broken off, probably before fossilization, along the line of junction with the regular rows of the pavement, which remain. Woodward (1895) mentions the fine outer pavement in only one or two specimens among all the European species he described.

In the holotype a small portion of the outer pavement is missing from the right margin of the specimen. Mr. Barber, by sifting loose material from the place where the specimen lay, recovered what is evidently this small fragment. It shows that the pavement of the specimen (fig. 9, *a*) continued laterally in small pavement teeth of steadily diminishing size. The fragment is not shown in the figure, as I found no contact line for its attachment, the edges being abraded.

The type and paratype show that considerable individual variation existed in the pycnodont dentition within one species. Thus, the last place in the principal row of teeth is occupied, as a rule, by a single elliptical tooth (as in fig. 9, *b*). But in the type specimen, by an anomaly, there are two broad teeth, placed end to end. The symphyseal row also shows a variation, there being a row and a half-row in the type, but only the single row in the paratype.

Anomoeodus barberi resembles *A. latidens* Gidley (1913, fig. 5), from the Cretaceous of Mississippi, in the general shape of the principal teeth. But close comparison discloses a definite difference in the outline of these teeth in the two species. In *A. barberi* nearly the entire tooth shows very gradual tapering toward the inner point, whereas in *A. latidens* the tapering is mainly in the pointed portion of the tooth.

In *Anomoeodus phaseolus* (Hay), known from the Cretaceous of New Jersey and Mississippi, the large teeth are relatively narrower than in *A. barberi*.

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